Bronchial blocker for one-lung ventilation: An unanticipated complication

Sir,

Techniques described for achieving lung isolation for thoracic surgery include the use of double-lumen tubes (DLT) and bronchial blockers. The bronchial blocker has several advantages over DLTs, especially in the setting of the difficult airway.[1] However, potential disadvantages include longer time for placement, longer time for lung collapse and poor quality of suctioning through the blocker.[2]

We wish to report the case of an unanticipated airway obstruction following the use of a bronchial blocker. A 64-year-old male, a known case of obstructive airway disease, was posted for a right bilobectomy for carcinoma lung. Pre-operative airway examination was normal. Direct laryngoscopy under general anaesthesia revealed Cormack Lehane grade 3 laryngeal view. Two attempts at insertion of a 39 F left-sided DLT were unsuccessful. A third attempt was made to insert the DLT over a bougie; however, this also failed. Finally, a single-lumen endotracheal tube was inserted over the bougie.

It was now decided to use a Coopdech bronchial blocker for lung isolation. Because we did not have an appropriate-sized fiberoptic bronchoscope, the bronchial blocker was inserted blindly through the endotracheal tube and placement in the right main bronchus was confirmed by auscultation. The patient was placed in the left lateral decubitus position and surgery was commenced. Lung isolation was satisfactory and one-lung ventilation was well tolerated.

Intra-operatively, it was decided to convert the procedure to a pneumonectomy. When the surgeons were ready to clamp the right main bronchus, the bronchial blocker was withdrawn after suctioning through the lumen of the blocker. However, immediately after removal, there was sudden resistance to ventilation and within a minute, the saturation dropped from 98% to 60%. Manual ventilation with 100% oxygen was started. The bronchial blocker was quickly examined and was found to be intact. Auscultation revealed grossly decreased air entry on the left side. Meanwhile, the saturation and the end-tidal carbon dioxide dropped further. Help was called for, rigid and fiberoptic bronchoscopes were kept ready and preparations for a left bronchotomy were made. Repeat suctioning of the trachea was performed after saline instillation and ventilation with higher pressures and a few blood clots were subsequently removed. The saturation increased from 29% to 88% within a minute and subsequently stabilized at 96–98%. The rest of the surgery was uneventful. When the surgery was complete, the patient was turned supine and rigid bronchoscopy was performed. Some more blood

clots were found in the left main bronchus. In view of multiple airway instrumentation attempts, it was decided to electively ventilate the patient overnight. The patient was extubated the next morning and the rest of his post-operative course was uneventful.

In patients who require one-lung ventilation and present with a difficult airway, the recommendation is to primarily secure the airway with a single-lumen endotracheal tube and, subsequently, use an independent bronchial blocker to achieve lung isolation.[1] An alternative that has been described is to use an airway exchange catheter technique and change the single-lumen tube for a DLT[1] – this procedure failed in our patient. One of the disadvantages of bronchial blockers as compared with DLTs is the presence of a smaller and possibly less-effective suction port.[2] In our case, excessive handling of the lung might have led to accumulation of blood and secretions that could not be suctioned adequately through the lumen of the bronchial blocker. This subsequently led to obstruction of the dependent bronchus. Options to avoid this complication would include continuous intra-operative suction of the blocker lumen and placement of an independent suction catheter in the tracheal lumen prior to deflating the bronchial blocker, to trap any retained secretions. There have been case reports of airway obstruction due to accidental fracture of the bronchial blocker,[3] displacement of the blocker into the tracheal lumen[4] and inclusion of the blocker in the bronchial stapler line.[5] In this patient, we ruled out these possibilities by examining the blocker after removal. Sudden inability to ventilate the patient intra-operatively is an anaesthetic emergency. The anaesthesiologist must be prepared to identify the cause of the obstruction and formulate an alternative plan for airway management.

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